

# Cognitive and communicative disorders and behavioral changes affected by harmful noise employment in the industrial field

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## ABSTRACT

**Introduction:** Perhaps the most forgotten process in personal interaction is the subject of communication and cognitive skills. The job position is significantly affected by interpersonal relationships, so the purpose of this study is to investigate the relationship between communication and behavioral skills in the noisy environment of metal industries in Isfahan province. **Materials and Methods:** The statistical population of this study consists of 500 workers and managers of Isfahan steel industries, including 500 people. The statistical sample was considered as a whole number. The Pennsylvania Concern Questionnaire (PSWQ), Ambiguity Intolerance Questionnaire (IUS), and Cognitive Avoidance (CAQ) and Communication Skills Questionnaire were used to measure data after measuring harmful workplace noise for both pre-test and post-test stages. Data were analyzed using repeated-measures analysis of variance using SPSS 22 software. **Results:** The results of repeated measures analysis of variance showed that the difference in scores in the two stages of pre-test and post-test in the variables of anxiety, ambiguity intolerance, cognitive avoidance, emotion regulation, and message comprehension were statistically significant ( $P < 0.05$ ). **Conclusion:** Since cognitive components specifically affect behavioral components (worry, intolerance, ambiguity, cognitive avoidance, listening, emotion regulation, message comprehension, insight, assertiveness) concerning the effect of behavioral-communication therapy use Recommended by clinical specialists in work centers.

**Keywords:** communication skills, cognitive factors, psychology, industrial workers.

## Introduction

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In today's societies where human problems have become more complex, communication becomes more important. In such communities, communication is one of the most important factors for human development <sup>[1]</sup>. As a social institution, the organization establishes a kind of organizational relationships between people because of basic goals beyond everyday relationships. But as a social creature, to meet the needs of individual and social life, the human needs to communicate and interact with other people. One of the fundamental assumptions of organizational behavior is recognizing individual and interpersonal characteristics of individuals to achieve greater

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productivity and achieve organizational goals. The authors point out that in achieving organizational goals, successful managers exhibit thinking, guidance, control, and change of employee behavior and this process requires extensive research regarding individual differences, development of human communication, and cultural differences in different societies [2, 3]. Communication creates a sense of sociability in humans, and in establishing this relationship, one achieves new skills and as far as organizations expand, human communications become more complex. Communication is the transfer of information from the sender to the receiver, which is understandable for both. No communication is established if one of these elements is not available [4, 5]. Communication is all the ways in which one mind may influence another. This action not only by writing or speaking, but even with music, visual arts; Theater, ballet and virtually all human behavior is practical. This means that the concept of a person's mind can be found and transmitted to others [6]. Communication of other topics such as transfer of concepts, transfer of meanings, and transfer of messages. Communication is a process that includes both the sender and the receiver [7, 8]. This may be filled with errors or interpreted by bad receivers. In this case, the recipient will be confused and your chances of creating an effective communication will be lost. The communication between the two people is very successful when the sender and receiver have the same information about the relationship between themselves and the conclusion. In other words, communication is the transfer of information from the sender to the receiver so that it is clear to both sides. If the others receive your message clearly and successfully, you can convey your thoughts and ideas to them. But the inability to deliver a clear and successful message to others will be a barrier to communication and will be an obstacle to your personal and business interests [9, 10]. There is a significant relationship between the components of communication skills and interpersonal relationships among managers in the study of Jawad Hussein. It was found that nonverbal Meta - cognitive behaviors can lead the social process to better skills of cognitive behavior [11].

Surveys of companies with more than 50,000 employees show that communication skills are one of the most important principles for these companies to hire managers in various departments. A survey conducted by the University of Gothenburg Business School shows that communication skills such as oral and written presentation skills and teamwork are key factors in achieving career success [12]. Hearing loss due to impaired speech and language communication has a great impact on individual and social life. Hearing loss is very common and occurs under the influence of various pathogens at different ages [13]. The development of science and technology and the use of various tools and devices in the production process on the one hand and the exposure of workers to various harmful factors, on the other hand, has led to increasing attention to occupational health of workers as the main assets of the industry. When the sound level exceeds the allowable limit,

it can have detrimental effects on the function of different parts of the body such as hearing, blood circulation, mental condition, and work efficiency [14]. Occupational noise is one of the leading causes of hearing impairment worldwide. Sound-induced hearing loss has major human and economic consequences. In New Zealand, for example, it receives \$ 53 million in annual compensation for who people loss the ability of hearing, which continues to rise [15]. From a physical point of view, noise is a set of complex and irregular sound vibrations and a mechanical vibration that propagates in the form of sound waves in an elastic medium (often air, even liquids, and solids) [16].

Noise pollution is considered as one of the most important physical harmful factors in work environments [17]. The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Industrial Health Professionals (ACGIH) recommend the occupational exposure limit for noise (A) 85 dB with a TWA weighted average-time standard of 3 dB for 8 hours of work [18]. The World Health Organization (WHO) also estimates that 10% of the world's population is exposed to sound that has the potential to cause hearing loss [19]. Worldwide, 16% of hearing loss is due to occupational exposure to noise, of which about one third is due to excessive noise exposure [20]. In some studies, the effects of sound on the human body have been considered in several ways, such as; damage to the auditory system, interference with a conversation, effects on the visual organs, effects on the balance system, social distress, neurological and psychological effects, effects on electrolytes, Noted physiological effects and mental effects [21]. The physiological and psychological effects of sound on humans often appear gradually and in the long run, directly affect the human nervous system and its negative consequences occur [22]. The purpose of this study is to investigate and intervene in the behavioral-cognitive components of personnel exposed to physical harm.

## Materials and Methods:

The present study was in the purpose-based category of applied research and the category based on the method of data collection was quasi-experimental research which was conducted in a pre-test-post-test design with two groups. Since communication skills disorder is common in the workplace, the target population in the first group (group affected by harmful noise) includes all-steel industry workers and the target population in the second group (control group without harmful noise) includes all department employees. It was the administrative office of the steel industry in Isfahan. The selected population was selected by convenience sampling through call. The sampling details of this group were as follows: among the people who contacted the researcher through the call and volunteered, after the diagnostic evaluation according to the clinical interview and completing the questionnaire, people who meet the criteria of general communication and behavioral disorder were included in the study. Clients were given pre-test

questionnaires (Pennsylvania Concern Questionnaire, Ambiguity Tolerance, and Cognitive Avoidance Scale) at the beginning of the first session and before completion. After completing the psychological intervention by the factory clinical specialist, the questionnaires were administered again for the post-test stage.

The sample group of the second group (under the influence of sound) also included 250 workers of the Isfahan steel industry who were selected by the available non-probability sampling method. The sampling details of the sample group were as follows: first, among the factory people, those who received the diagnosis of behavioral and communication disorders (mood disorders) according to the psychiatrist, were excluded from the study.

The selected workers in the study all included outpatient treatment and none were admitted to hospital psychiatric wards. The neurologist performed drug therapy, and patients under the supervision of a psychiatrist took anti-anxiety drugs to reduce behavioral and communication stresses. No specific drugs were studied for therapeutic efficacy, and the choice of drug was left to the psychiatrist. Eligible individuals were asked to complete pre-test questionnaires in factory occupational medicine. In the next step, after taking serotonin reuptake inhibitors (SSRIs) containing 100 mg sertraline or 40 ml citalopram for one month, these individuals were asked to return to factory occupational medicine and post-test questionnaires. Finally, the results of the data of 500 people were statistically analyzed. Criteria for inclusion in the study were: age range between 18 and 40 years, not receiving services or not receiving psychology and medication. Subjects were interviewed using a clinical interview and scored above average on the Beck Anxiety Schedule Questionnaire, as well as scores ranging from 60 to 80 on the Pennsylvania State Concern Questionnaire. Exclusion criteria were: morbid association with other mental disorders, psychotic symptoms (hallucinations, delirium (presence of any physical illness and use of psychiatric drugs) for the sample group (which was measured using clinical interviews and psychiatrist theory).

## Research tools

One of the applied topics in the field of occupational health engineering is the issue of measuring and evaluating the equivalent level of exposure to sound and the level of power of audio sources. Standard 9612 provides a step-by-step engineering method for determining the degree of noise exposure of workers in the workplace and equivalent noise level calculations, and the measurement results obtained provide useful information for prioritizing noise control measures. This standard consists of 5 main steps that are measured in network A.

1- Analysis of work, 2- Selection of measurement strategy, 3- Measurement, 4- Error management and uncertainty assessment, 5- Calculations, and presentation of results.

This standard uses a job-based strategy to measure sound. This international standard provides complete guidance for selecting a specific situation according to the purpose under consideration. The 9612 standard is an international standard that is not intended to assess the masking of oral communication or to assess ultrasound and ultrasound and the non-auditory effects of sound, or to assess the extent to which people are exposed to hearing aids. They are not applicable <sup>[20-23]</sup>. A calibrated sound level meter was used to measure the sound level, and in the case where the operator is working in several shifts at the same time with several devices, a dosimeter was used to facilitate and increase the measurement accuracy. The main advantage of a dosimeter is that several workers can be tested simultaneously <sup>[20]</sup>. To collect the data, in addition to the demographic questionnaire used to obtain the demographic information of the clients, other questionnaires and scales were used:

- **Pennsylvania State Concern Press**

The Pennsylvania Worry Questionnaire is a gold standard for measuring anxiety that has been used in most studies related to anxiety and generalized anxiety disorder over the past decade <sup>[24]</sup>. This questionnaire has 16 questions and concerns and controls the intensity. Items on a five-point Likert scale, from 1) not true at all (up to 5) very true (scored. This questionnaire has a lot of internal stability) Alpha 0.86 to 0.95 Reliability of retesting four weeks It has been reported between 0.74 and 0.93 <sup>[25]</sup>. In Iran, Cronbach's alpha coefficient for the internal consistency of the total concern score was calculated to be 0.91 and also the retest validity was reported twice with an interval of two to four weeks for the total concern score of 0.78 <sup>[26]</sup>.

- **Ambiguity tolerance scale**

The Ambiguity Tolerance Scale includes 27 items to measure negative beliefs about ambiguity <sup>[24]</sup>. Subjects are scored on a five-point Likert scale. Cronbach's alpha coefficient of 0.94 and the reliability of the five-week retest of this press is reported to be 0.74. Also, the tolerance ambiguity scale shows acceptable convergent and divergent validity with the anxiety, depression, and anxiety scales <sup>[27]</sup>. In Iran, Cronbach's alpha and test reliability after 5 weeks were reported to be 0.94 and 0.74, respectively <sup>[28]</sup>.

- **Cognitive avoidance questionnaire**

The Cognitive Avoidance Questionnaire is designed to measure cognitive avoidance and has 25 items that measure five types of cognitive strategies <sup>[29]</sup>. Subjects are scored on a five-point Likert scale, from 1) not true at all (up to 5) very true (this questionnaire has a good internal consistency; Yerkronebach's alpha coefficient of 0.95 and the reliability of retesting this scale in six weeks). The cognitive avoidance questionnaire also has a better convergent and divergent validity compared to the scales of concern, suppression of thoughts, and opposing styles <sup>[29]</sup>. In Iran, Cronbach's alpha coefficients for internal consistency of

subscales and total avoidance score was calculated from 0.73 to 0.92 and was reported to be valid for retesting twice with two to four weeks interval for subscales and total cognitive avoidance score of 0.68 to 0.80 [30].

To investigate the effect of voice on communication skill variations, a Jarabak questionnaire has been developed which has validity and reliability. based on the communication models, the information that the individual acquires through his five senses, the information that one acquires through his five senses, pass the information processing filter based on the values and decisions and the individual can change and generalize. However, the influence on receiving the message and ensuring the effectiveness of the message and the development of influence on the source of the goal and knowledge of the factors affecting the behavior and understanding the individual and personality characteristics of individuals and on the other hand development of the practical knowledge of influence and power and the factors influencing the influence behavior are among managerial concerns in organizational behavior.

To assess communication skills, the revised version of the communication skills questionnaire, developed by Jarabak in 2004, is used. This questionnaire has 34 items that require the use of a 5-point Likert scale (1 = never, 5 = always). The validity of this questionnaire in the research of Hossein Jari and Fedakar in 2005 in a sample consisting of 733 Iranian students using Cronbach's alpha method and halving for the total test score in the sample of students equal to 0.71 and / 69, respectively. 0 has been reported. In the study, the values of the coefficients were 0.81 and 0.77, respectively. Also, Hossein

Jari and Fedakar in 2005, using a statistical-analytical method, examined the validity of the questionnaire and divided it into 5 factors: verbal and non-verbal message comprehension skills, emotion regulation skills, listening skills, and skills. They gained insights into the communication process and assertiveness in communication [31] and [32]. Descriptive statistics (mean and standard deviation) and repeated measures analysis of variance were used to analyze the data using SPSS 22 software.

## Results

In the present study, 500 workers of the Isfahan Steel Industry participated, of which 250 were assigned to the case group and 250 to the control group. The mean age of the workers participating in the study was  $30.45 \pm 3.28$  years and their mean work experience was  $8.56. 2.10$  years. All the workers in the study were men. In this study, 74% of the sample had undergraduate education, 21% had a diploma and 5% had a bachelor's degree or higher. 14% of the sample was single and 86% were married. 36% worked in day shift, 10% in night shift, and 54% on a rotating basis. There was no significant difference between case and control groups in the variables of education, marital status, and shift work ( $p$ -value > 0.05) and (Table 1). But the age of the subjects in the case group ( $33.06 \pm 2.25$ ) was significantly higher than the control group ( $27.84. 1.68$ ) ( $p$ -value < 0.001). Also, the work experience of the workers in the case group ( $9.90 \pm 1.76$ ) was significantly higher than the control group ( $7.22. 1.48$ ) ( $p$ -value < 0.001) and (Table 1).

**Table 1: Comparison of demographic characteristics, work shift and work experience in case and control groups (data are reported as (%) frequency)**

p-value	the group		Variables
	control (n=250)	case (n=250)	
0.860*	158(76%)	136(72%)	High school
	82(20%)	100(22%)	Diploma
	10(4%)	14(6%)	Bachelor's degree and higher
0.249*	12(10%)	30(18%)	Single
	238(90%)	220(82%)	Married
1.00*	60(34%)	75(36%)	Day
	33(12%)	38(10%)	Night
	157(61%)	137(54%)	Circulating
<0.001**	27.84±1.68	33.06±2.25	(Age (standard deviation ± Mean
<0.001**	7.22±1.48	9.90±1.76	(Work experience (years) (standard deviation ± average

\* Chi-square test

\*\*Independent T-test

Descriptive characteristics and statistical indicators of the two groups in the dependent variables of research in the pre-test and post-test stages are presented in Table 2. Then the findings related to the research hypotheses are presented. Analysis of variance with repeated measures was used to analyze the research findings. The results of the Levin 18 test to test the

assumption of homogeneity of variance showed that its amount was not significant in any of the dependent variables. Hence, the assumption of homogeneity of variances has been fulfilled and it can be assured that the distribution of scores is the same in both groups ( $p \leq 0.05$ )

Examination of the test results on the equality of the covariance matrix also showed that the assumption of homogeneity of the variance-covariance matrix is established ( $F = 1/2 P = 0.001$ ). Therefore, the assumption of using analysis of variance is observed. Also, reviewing the results of the Mochelli 19 sphericity test rejects the establishment of the sphericity

condition in the same way that multivariate statistics do not require sphericity. With no sphericity assumption, the Greenhouse-Gisher-20 correction was used to perform the symptom score test (concern, intolerance, ambiguity, cognitive avoidance) in two measurements and for the effects within the subjects.

**Table 2: Mean and standard deviation of groups in pre-test and post-test stages**

(Mean )standard deviation		Components	
case group	Control group		
69.33(9.58)	66.16(6.99)	Pre-test	Pennsylvania Concerns
61.77(10.28)	42.75(10.40)	Post-test	
66.16(6.99)	105.41(13.75)	Pre-test	Intolerance of ambiguity
42.75(10.40)	66.78(19.67)	Post-test	
105.41(13.75)	67.88 (22.35)	Pre-test	Cognitive avoidance
66.78(19.67)	91.35(15.35)	Post-test	
67.88 (22.35)	65.04(16.01)	Pre-test	listening
91.35(15.35)	100.25(40.25)	Post-test	
65.04(16.01)	66.16(6.99)	Pre-test	Set emotions
100.25(40.25)	42.75(10.40)	Post-test	
66.16(6.99)	105.41(13.75)	Pre-test	Understand the message
42.75(10.40)	66.78(19.67)	Post-test	
105.41(13.75)	67.88 (22.35)	Pre-test	Insight
66.78(19.67)	91.35(15.35)	Post-test	
67.88 (22.35)	65.04(16.01)	Pre-test	Strictly
91.35(15.35)	100.25(40.25)	Post-test	

Based on the results obtained from Table 3, the results of the analysis of variance with repeated measures show the difference in scores in the two stages of pre-test and post-test in the variables of concern  $F = 12 P < 0.05$ , intolerance of ambiguity  $P < 0 / 05 F = 4$ , and cognitive avoidance  $P < 0.05 F = 0$  is statistically significant.

Bonferroni post hoc test was used to compare the two pairs, the results of which are summarized in Table 4. The results of Table 4 show that at the level of  $p = 0.05$ , the means of the

cognitive-behavioral group at two times (pre-test and post-test) are significantly different, while in the drug treatment group, this difference is not observed. Findings from the data analysis indicate that cognitive-behavioral therapy focuses on ambiguity intolerance compared to drug therapy on the components of anxiety, ambiguity intolerance, and cognitive avoidance in patients with generalized anxiety disorder compared to drug therapy. It is more effective.

**Table 3: Results of intergroup analysis of variance with repeated measures to compare the trend of scores in pre-test and post-test in the two groups**

Chi Eta	P	F	Average squares	df	Sum of squares	Source of changes	Variable
0.36	0.002	12.53	1474.08	1	1474.08	Case	Pennsylvania Concerns
			120.66	22	2586.91	Control	
0.17	0.048	4.40	2380.08	1	2380.08	Case	Intolerance of ambiguity
			340.88	22	11886.91	Control	
0.02	0.049	0.44	184.093	1	184.093	Case	Cognitive avoidance
			400.087	22	8999.917	Control	
0.25	0.001	10.55	235.107	1	235.107	Case	listening
			305.66	22	2318.11	Control	
0.28	0.001	15.22	135.250	1	135.250	Case	Set emotions
			200.035	22	1055.85	Control	
0.12	0.002	13.25	143.369	1	143.369	Case	Understand the message
				22	2556.22	Control	
0.23	0.015	16.25	550.24	1	550.24	Case	Insight

				22	1024.550	Control	
0.15	0.001	15.23	184.035	1	184.035	Case	Strictly
				22	5023.22	Control	

## Discussion:

In today's societies where human problems have become more complex, communication becomes more important. In such communities, communication is one of the most important factors for human development. As a social institution, the organization establishes a kind of organizational relationships between people because of basic goals beyond everyday relationships. According to the results of this study, to study the effectiveness of communication and verbal skills in working memory, and in the study of nonverbal communication skills, it is suggested that nonverbal metacognitive behaviors can lead the social process to better skills of cognitive behavior [7, 33].

Elizabeth Pager showed the effects of metacognitive and behavioral differentiation as a combination of summoning and metacognitive skills that people with higher verbal power are better able to read and communicate in their community or profession and this is in line with the present study [33]. Hemmati and his colleagues examined communication skills between nurses and in line with the present study, showed a significant relationship between communication skills and patients' safety status in the intensive care unit [34]. Hosseinpour and his colleagues examined communication skills and interpersonal relationships and it was concluded that there is a significant relationship between the components of communication skills and interpersonal relationships of managers that the present study is not consistent [11]. In the satisfaction study, the performance of communication skills and the type of attitudes of physicians with patients were examined and showed that communication skills had a positive attitude and 35% had a negative attitude. The distribution of this attitude was the same in gender and specialty, but physicians in the older age group and with more work experience, paid more attention to communication skills and it is not in line with the results [35]. In the final and general explanation of the results of the present study about the greater effectiveness of communication-behavioral skills intervention, it can be said that considering that therapeutic-behavioral intervention deals specifically with cognitive components (concern, intolerance of ambiguity and cognitive avoidance). The selected tools often measure the components related to the intervention performed for this group. The effectiveness of this treatment on the studied variables can be justified when compared to drug treatment. The present study also had some limitations, including Limitations related to sampling method, random selection of subjects, sample size, use of self-report questionnaires as data collection tools, and lack of follow-up

sessions can be mentioned. The two groups under study are completely separate and with different selection methods. Therefore, the comparison of the results between the two groups and the generalizations of the findings should be done with caution. Also, similar studies on samples have to be carried out with a larger volume in other industries and follow-up studies to evaluate the long-term effectiveness of such studies; because long-term follow-up evaluations can help to understand the long-term effects of this treatment on the variables studied. It is suggested that more research has to be done with behavioral-metacognitive models, based on emotion regulation, mindfulness, acceptance, and commitment to the variables under study.

## Ethical considerations

At the beginning of the research, permission was granted from the owner of the questionnaire to design the questionnaire. Confidential and anonymous is used only for the study, and the identities of individuals within the framework of ethics in research will remain confidential.

## Conflict of interest

This study did not provide any conflict of interest between the authors.

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## References

1. Nazari S, Dadkhah M. The role of communication skills in choosing the leadership style of sports media managers in Isfahan province. *Journal of Communication Management in Sports Media*. 2013;1(2):9-13.
2. Nazari, Ehsani, Ganjavi A, Farid, Ghasemi. Structural Equation Model of the Effect of Communication Skills on Interpersonal Communication and Its Role on Organizational Effectiveness of Iranian Sports Managers. *Journal of Sports Management*. 2014; 5 (4): 67-82.
3. King DL, Delfabbro PH. The cognitive psychology of Internet gaming disorder. *Clinical psychology review*. 2014;34(4):298-308.
4. Zimmermann M, Dostert K. Analysis and modeling of impulsive noise in broad-band powerline communications.

- IEEE transactions on electromagnetic compatibility. 2002;44(1):249-58.
5. Tiuraniemi J, Läärä R, Kyrö T, Lindeman S. Medical, and psychology students' self-assessed communication skills: A pilot study. *Patient Education and Counseling*. 2011;83(2):152-7.
  6. Razavi D, Delvaux N. Communication skills and psychological training in oncology. *European Journal of Cancer*. 1997;33:S15-S21.
  7. Lai ER. Metacognition: A literature review. *Always learning: Pearson research report*. 2011;24.
  8. Neuman GA, Wright J. Team effectiveness: beyond skills and cognitive ability. *Journal of Applied psychology*. 1999;84(3):376.
  9. Elving WJ. The role of communication in organizational change. *Corporate communications: an international journal*. 2005.
  10. Hofmann SG. Cognitive factors that maintain social anxiety disorder: A comprehensive model and its treatment implications. *Cognitive behavior therapy*. 2007;36(4):193-209.
  11. Poor H., Hosseini, Emad S., Friendship. Relationship between communication skills and interpersonal relationships of sports managers in Guilan province. *Sports management and development*. 2014; 3 (2): 91-104.
  12. Schram WE. The process and effects of mass communication. 1954.
  13. Bendokiene I, Grazuleviciene R, Dedele A. Risk of hypertension related to road traffic noise among reproductive-age women. *Noise and Health*. 2011;13(55):371.
  14. Golmohammadi R, Aliabadi M, Darvishi E. Study of noise pollution in the blast furnace of a steel industry in order to noise control. *J Health Syst Res*. 2014;9(12):262-72.
  15. Jahangiri M, Golmohammadi R, Aliabadi M. Determination of main noise sources in a thermal power plant. *Health and Safety at Work*. 2014;4(3):13-22.
  16. Reza T., Ahmad Q, Farhad Q. Investigation of the effects of noise pollution on the hearing system of workers working in one of the metal industries of Arak.
  17. Golmohammadi R, Giahhi O, Aliabadi M, Darvishi E. An intervention for noise control of blast furnace in steel industry. *Journal of research in health sciences*. 2014;14(4):287-90.
  18. LOSS IH. Occupational Hearing Loss: What Are Some Occupations Not Commonly Considered at Risk? 2018.
  19. Frick K. Work environment dialogue in a Swedish municipality-strengths and limits of the Nordic work environment model. *Nordic journal of working life studies*. 2013;3(1):69.
  20. Mohsen AA, Ibrahim D, Akbar Shakha. Evaluation of ambient noise level and noise exposure in a steel industry.
  21. NASIRI P, MONAZAM EM, RAHIMI FA, EBRAHIMI H, Salimi Y. Occupational noise exposure evaluation in drivers of bus transportation of Tehran City. 2009.
  22. Karamkhani H. Noise pollution and vibration. *J Environ*1994;(4). 1996:23-8.
  23. Mansoori Na, Allah N, Nasiri, Parvin. Assessing the volume and its effects in a car parts factory. *Quarterly Journal of Environmental Science and Technology*. 2002; 4 (2): 1-12.
  24. Perna G, Alciati A, Riva A, Micieli W, Caldirola D. Long-term pharmacological treatments of anxiety disorders: an updated systematic review. *Current psychiatry reports*. 2016;18(3):23.
  25. Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State worry questionnaire. *Behavior research and therapy*. 1990;28(6):487-95.
  26. Molina S, Borkovec TD. The Penn State Worry Questionnaire: Psychometric properties and associated characteristics. 1994.
  27. Besharat M. Psychometric properties of a Farsi version of the Resilience Scale. Unpublished research report Tehran: University of Tehran[Farsi]. 2007.
  28. Buhr K, Dugas MJ. The intolerance of uncertainty scale: Psychometric properties of the English version. *Behavior research and therapy*. 2002;40(8):931-45.
  29. Narimani M, Ariapooran S, Abolghasemi A, Ahadi B. The comparison of the effectiveness of mindfulness and emotion regulation training on mental health in chemical weapon victims. 2011.
  30. Sexton KA, Dugas MJ. The cognitive avoidance questionnaire: validation of the English translation. *Journal of Anxiety Disorders*. 2008;22(3):355-70.
  31. Masoud Hach, Mohammad Mehdi F. Investigating the effect of university on communication skills based on comparison of students.
  32. Masoud Hach, Mohammad Agha D. Do shy people lack communication skills?.
  33. Pieger E, Bannert M. Differential effects of students' self-directed metacognitive prompts. *Computers in Human Behavior*. 2018;86:165-73.
  34. Ravani Pour M, Vanaki Z, Afsar L, Azemian A. The standards of professionalism in nursing: the nursing instructors' experiences. *Evidence-Based Care*. 2014;4(1):27-40.
  35. Rezaei, Rita, Hosseini, Jalil S., Velayai, Nasser. Performance of physicians 'communication skills with patients and physicians' attitudes toward it, Shiraz, 1999. *Feyz Scientific Research Journal :: Kashan University of Medical Sciences*. 2001; 4 (4): 19-26.